

What is claimed is:

1. A method of providing a breathing gas comprising the steps of:

sensing a parameter associated with the delivery of a breathing gas;

changing a valve position in response to a change in the sensed parameter;

determining a breathing state based on the valve position; and

causing a change in the sensed parameter of the breathing gas based on the determined breathing state.

2. The method of claim 1 wherein the step of determining a breathing state associated with a valve position comprises determining a breathing state associated with a valve step position.

3. The method of claim 1 wherein the step of determining a breathing state associated with a valve position comprises determining if a peak valve step position has occurred.

4. The method of claim 1 wherein the step of determining a breathing state associated with a valve position comprises determining if the valve position is equal to or below a peak valve step position.

5. The method of claim 1 further comprising the step of providing at least a first breathing gas state in response to at least one valve position.

6. The method of claim 5 further comprising the step of providing at least a second breathing gas state in response to at least one other valve position.

7. A method of providing a breathing gas comprising the steps of:

sensing a pressure associated with the delivery of a breathing gas to a patient interface;

changing a valve position in response to a change in the sensed pressure;

detecting a start of inhalation state by determining if the valve position has increased beyond a start of inhalation state threshold value;

detecting an end of inhalation state by determining if the valve position has fallen below an end of inhalation state threshold value;

delivering the breathing gas at least at a first positive pressure above ambient pressure after detection of the start of inhalation state; and

delivering the breathing gas at least at a second pressure after detection of the end of inhalation state wherein the second pressure is less than the first pressure.

8. The method of claim 7 further comprising determining the duration of an exhalation state based by measuring the time between the start of the inhalation state and the end of the inhalation state.

9. The method of claim 7 wherein the step of delivering the breathing gas at least at a second pressure comprises delivering the breathing gas at a substantially ambient pressure for at

least a portion of an exhalation state following the end of inhalation state.

10. The method of claim 7 wherein the step of delivering the breathing gas at least at a second pressure comprises delivering the breathing gas at a substantially ambient pressure for at least a first portion of an exhalation state and delivering the breathing gas at a third pressure for at least a second portion of the exhalation state wherein the third pressure is between the first and second pressures.

11. The method of claim 7 further comprising the step of delivering the breathing gas from the second pressure to the first pressure according to a predefined function and prior to the detection of the next start of inhalation state.

12. The method of claim 10 wherein the step of delivering the breathing gas at a third pressure comprises the step of delivering the breathing gas according to a function that raises the pressure from the second pressure to the first pressure prior to the detection of the start of inhalation state.

13. The method of claim 7 wherein the step of determining a breathing state associated with a valve position comprises determining a breathing state associated with a valve step position.

14. The method of claim 7 wherein the step of detecting an end of inhalation state by determining if the valve position has fallen below an end of inhalation state threshold value comprises determining if a peak valve step position has occurred.

15. The method of claim 14 wherein the step of detecting an end of inhalation state by determining if the valve position has fallen below an end of inhalation state threshold value further comprises determining if the valve position is equal to or below the peak valve step position.

16. A system for delivering a breathing gas to a patient interface comprising:

a pressure sensor;

a blower;

a valve;

a controller connected to the sensor, blower and valve, the controller comprising a memory having a plurality of executable instructions, wherein the executable instructions comprise:

a first set of instructions sensing a pressure associated with the delivery of the breathing gas to the patient interface;

a second set of instructions changing the valve position in response to a change in the sensed pressure;

a third set of instructions detecting a start of inhalation state by determining if the valve position has increased beyond a start of inhalation state threshold value;

a fourth set of instructions detecting an end of inhalation state by determining if the valve position has fallen below an end of inhalation state threshold value;

a fifth set of instructions delivering the breathing gas at least at a first positive pressure above ambient pressure after detection of the start of inhalation state; and

a sixth set of instructions delivering the breathing gas at least at a second pressure after detection of the end of

inhalation state wherein the second pressure is less than the first pressure.

17. The system of claim 16 further comprising a seventh set instructions delivering the breathing gas from the second pressure to the first pressure according to a predefined function and prior to the detection of the next start of inhalation state.

18. The system of claim 17 wherein the predefined function is a linear function.

19. The system of claim 17 wherein the predefined function is associated with a sensed pressure associated with the patient interface.

20. The system of claim 17 wherein the second pressure comprises at least an ambient pressure.